

IN THE CLAIMS

Claim 1 (Previously Presented): A 3D image processing apparatus comprising:

a storing unit configured to store data of a plurality of mask images corresponding to a plurality of projection directions associated with an object to be examined, and data of a plurality of contrast images corresponding to the plurality of projection directions associated with the object;

a first subtracting unit configured to generate data of a plurality of subtraction images by subtracting the plurality of mask images from the plurality of contrast images;

a reconstruction unit configured to reconstruct first volume data from the plurality of contrast images and configured to reconstruct second volume data from the plurality of subtraction images;

a second subtracting unit configured to generate mask volume data by subtracting the second volume data from the first volume data,

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft tissue structure from the mask volume data, and configured to generate data of a second 3D image representing a contrasted blood vessel from the second volume data;

an image synthesizing unit configured to generate data of a synthetic image by synthesizing the first 3D image with the second 3D image; and

a displaying unit configured to display the synthetic image.

Claim 2 (Original): An apparatus according to claim 1, wherein the image synthesizing unit generates data of the synthetic image such that the second 3D image is displayed in a color different from that of the first 3D image.

Claim 3 (Original): An apparatus according to claim 1, wherein the image synthesizing unit assigns color information to the second 3D image independently of the first 3D image.

Claim 4 (Original): An apparatus according to claim 1, wherein the image processing unit generates the data of the first and second 3D images by volume rendering processing.

Claim 5 (Original): An apparatus according to claim 1, wherein the displaying unit singly displays the first 3D image or the second 3D image in place of the synthetic image in accordance with a user instruction.

Claim 6 (Previously Presented): A 3D image processing apparatus comprising:
a storing unit configured to store data of a plurality of mask images corresponding to a plurality of projection directions associated with an object to be examined, and data of a plurality of contrast images corresponding to the plurality of projection directions associated with the object;
a calibration unit configured to calibrate the plurality of mask images and the plurality of contrast images by using vertically and horizontally arranged lines forming a lattice as a calibration image;
a reconstruction unit configured to reconstruct first volume data from the plurality of contrast images, and configured to reconstruct second volume data from the plurality of mask images;
a subtracting unit configured to generate third volume data by subtracting the second volume data from the first volume data;

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft tissue structure from the second volume data, and configured generate data of a second 3D image representing a contrasted blood vessel from the third volume data;

an image synthesizing unit configured to generate data of a synthetic image by synthesizing the first 3D image with the second 3D image; and

a displaying unit configured to display the synthetic image.

Claim 7 (Original): An apparatus according to claim 6, wherein the image synthesizing unit generates data of the synthetic image such that the second 3D image is displayed in a color different from that of the first 3D image.

Claim 8 (Original): An apparatus according to claim 6, wherein the image synthesizing unit assigns color information to the second 3D image independently of the first 3D image.

Claim 9 (Original): An apparatus according to claim 6, wherein the image processing unit generates the data of the first and second 3D images by volume rendering processing.

Claim 10 (Original): An apparatus according to claim 6, wherein the displaying unit singly displays the first 3D image or the second 3D image in place of the synthetic image in accordance with a user instruction.

Claim 11 (Previously Presented): A 3D image processing apparatus comprising:

a storing unit configured to store data of a plurality of mask images corresponding to a plurality of projection directions associated with an object to be examined, and data of a plurality of contrast images corresponding to the plurality of projection directions associated with the object;

a first subtracting unit configured to generate data of a plurality of subtraction images by subtracting the plurality of mask images from the plurality of contrast images;

a reconstruction unit configured to reconstruct first volume data from the plurality of contrast images and configured to reconstruct second volume data from the plurality of subtraction images;

a second subtracting unit configured to generate third volume data by subtracting the second volume data from the first volume data;

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft tissue structure from the third volume data, and configured to generate data of a second 3D image representing a contrasted blood vessel from the second volume data;

an image synthesizing unit configured to generate data of a synthetic image by synthesizing the first 3D image with the second 3D image; and

a control unit configured to store the synthetic image in the storage unit.

Claim 12 (Previously Presented): An apparatus according to claim 11, wherein the image synthesizing unit generates data of the synthetic image such that the second 3D image is displayed by a display unit in a color different from that of the first 3D image.

Claim 13 (Original): An apparatus according to claim 11, wherein the image synthesizing unit assigns color information to the second 3D image independently of the first 3D image.

Claim 14 (Original): An apparatus according to claim 11, wherein the image processing unit generates the data of the first and second 3D images by volume rendering processing.

Claim 15 (Previously Presented): An apparatus according to claim 11, wherein the apparatus further comprises:

a display unit, the displaying unit configured to singly display the first 3D image or the second 3D image in place of the synthetic image in accordance with a user instruction.

Claim 16 (Previously Presented): A 3D image processing apparatus comprising:

a storing unit configured to stores data of a plurality of mask images corresponding to a plurality of projection directions associated with an object to be examined, and data of a plurality of contrast images corresponding to the plurality of projection directions associated with the object;

a calibration unit configured to calibrate the plurality of mask images and the plurality of contrast images by using vertically and horizontally arranged lines forming a lattice as a calibration image;

a processing unit configured to generate first volume data representing structures of a bone and soft tissue and second volume data representing a structure of a contrasted blood vessel on the basis of the data of the plurality of contrast images and the data of the plurality of mask images;

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft tissue structure from the first volume data, and configured to generate data of a second 3D image representing a contrasted blood vessel from the second volume data;

an image synthesizing unit configured to generate data of a synthetic image by synthesizing the first 3D image with the second 3D image; and
a displaying unit configured to display the synthetic image.

Claim 17 (Original): An apparatus according to claim 16, wherein the image synthesizing unit generates data of the synthetic image such that the second 3D image is displayed in a color different from that of the first 3D image.

Claim 18 (Original): An apparatus according to claim 16, wherein the image synthesizing unit assigns color information to the second 3D image independently of the first 3D image.

Claim 19 (Original): An apparatus according to claim 16, wherein the image processing unit generates the data of the first and second 3D images by volume rendering processing.

Claim 20 (Original): An apparatus according to claim 16, wherein the displaying unit singly displays the first 3D image or the second 3D image in place of the synthetic image in accordance with a user instruction.

Claim 21 (New): The 3D image processing apparatus of claim 1, further comprising:

a calibration unit configured to calibrate the plurality of mask images and the plurality of contrast images by using vertically and horizontally arranged lines forming a lattice as a calibration image.

Claim 22 (New): The 3D image processing apparatus of claim 11, further comprising:

a calibration unit configured to calibrate the plurality of mask images and the plurality of contrast images by using vertically and horizontally arranged lines forming a lattice as a calibration image.